WHAT IS CLAIMED IS:

1. A tire monitoring apparatus comprising:

a radar transceiver having an output, the radar transceiver positioned to illuminate a portion of a tire with RF signals and to receive reflected signals from the tire and configured to produce an output signal at the output thereof; and

a signal processor having an input coupled to the output of the radar transceiver and an output;

wherein the processor is configured to perform a signal analysis based on selected harmonics of the reflected signals received by the radar transceiver and to produce an output signal at the output thereof indicative of selected tire related parameters or anomalies.

2. A tire monitoring apparatus as in claim 1 wherein, the processor is configured to perform a signal analysis based on a selected range of harmonics of the reflected signals received by the radar transceiver.

3. A tire monitoring apparatus as in claim 2 wherein, the signal processor is configured to perform a signal analysis based on the average energy of the harmonic energy within the selected range of harmonics.

4. A tire monitoring apparatus as in claim 2 wherein, the signal processor is configured to perform a signal analysis based on the center of mass of the harmonic distribution within the selected range of harmonics.

5. A tire monitoring apparatus as in claim 3 wherein, the signal processor is configured to perform a signal analysis based on the center of mass of the harmonic distribution within the selected range of harmonics.

6. A tire monitoring apparatus as in claim 2 wherein, the range of harmonics is selected based on selected tire related parameters or anomalies.

7. A tire monitoring apparatus as in claim 6 wherein, the tire related parameters or anomalies are balance and alignment and the selected range of harmonics is the range from the 1^{st} to the 2^{nd} harmonic.

8. A tire monitoring apparatus as in claim 6 wherein, the tire related parameters or anomalies are tread belt separation and uneven tread wear and the selected range of harmonics is the range from the 3^{rd} to the n^{th} harmonic, where n is the fundamental harmonic related to the tread pattern.

9. A tire monitoring apparatus as in claim 6 wherein, the tire related parameter or anomaly is tread wear and the selected range of harmonics is the range from the n^{th} to the m^{th} harmonic, where n is the fundamental harmonic related to the tread pattern and m is the upper overtone of the tread pattern energy.

10. A tire monitoring apparatus as in claim 1 wherein, the radar transceiver is a Doppler radar transceiver.

11. A tire monitoring apparatus as in claim 10 wherein, the radar transceiver is a Doppler micro-power impulse radar transceiver.

12. A method for detecting tire related parameters comprising the steps of:

illuminating a portion of a tire with RF signals;

receiving signals reflected from the illuminated tire; and

analyzing selected harmonics of the received reflected signals to detect selected tire related parameters.

13. The method of claim 12, wherein the step of analyzing comprises:

selecting a range of harmonics of the reflected signals for analysis; and

analyzing the selected range of harmonics to detect selected tire related parameters.

14. The method of claim 13 wherein, the step of analyzing the selected range of harmonics comprises evaluating the average energy of the harmonic energy within the selected range of harmonics.

15. The method of claim 14 wherein, the step of analyzing the selected range of harmonics comprises evaluating the center of mass of the harmonic distribution within the selected range of harmonics.

16. The method of claim 13 wherein, the step of analyzing the selected range of harmonics comprises evaluating the center of mass of the harmonic distribution within the selected range of harmonics.

17. The method of claim 13 wherein, the step of selecting a range of harmonics is performed based on the tire related parameters to be detected.

18. The method of claim 17 wherein, the selected tire related parameters are balance and alignment and the selected range of harmonics is the range between the 1^{st} and 2^{nd} harmonic.

19. The method of claim 17 wherein, the selected tire related parameters are tread belt separation and uneven tread wear and the selected range of harmonics is the range from the 3^{rd} to the n^{th} harmonic, where n is the fundamental harmonic related to the tread pattern.

20. The method of claim 17 wherein, the selected tire related parameter is tread wear and the selected range of harmonics is the range from the n^{th} to the m^{th} harmonic, where n is the fundamental harmonic related to the tread pattern and m is the upper overtone of the tread pattern energy.

21. The method of claim 12 wherein, the steps of illuminating and receiving are performed by a Doppler radar transceiver.

22. The method of claim 21 wherein, the steps of illuminating and receiving are performed by a Doppler micro-power impulse radar transceiver.